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| 09/877,987 | 06/08/2001 | Robert M. Townsend | D0009NP/30436.53USU1 | 1712 |

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| EXAMINER | |
|---|---|
| GAMBEL, PHILLIP | |

| ART UNIT | PAPER NUMBER |
|---|---|
| 1644 | |

DATE MAILED: 11/19/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

| Office Action Summary | Application No. | Applicant(s) | |
|---|---|---|---|
| | 09/877,987 | TOWNSEND ET AL. | |
| | Examiner | Art Unit | |
| | Phillip Gambel | 1644 | |

*-- The MAILING DATE of this communication appears on the cover sheet with the correspond nce address --*

**P riod for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

1)☒ Responsive to communication(s) filed on *22 July 2003*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

4)☒ Claim(s) *1-36* is/are pending in the application.

4a) Of the above claim(s) *10 and 19-36* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-9 and 11-18* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

**Application Papers**

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. §§ 119 and 120**

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

13)☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application) since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

a) ☐ The translation of the foreign language provisional application has been received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121 since a specific reference was included in the first sentence of the specification or in an Application Data Sheet. 37 CFR 1.78.

**Attachment(s)**

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

## DETAILED ACTION

1. Applicant's election with traverse of Group I and the species of agent one is soluble CTLA4, the species of agent two is anti-CD154 antibody and the species of agent 3 is anti-LFA-1 antibody in Paper No. 11 and the species of cardiac allografts in the communication filed 7/22/03 is acknowledged.

Again, applicant is reminded that if applicant traverses on the ground that the species are not patentably distinct, applicant should submit evidence or identify such evidence now of record showing the species to be obvious variants or clearly admit on the record that this is the case. In either instance, if the examiner finds one of the inventions unpatentable over the prior art, the evidence or admission may be used in a rejection under 35 U.S.C. § 103 of the other invention.

Therefore, claims 1-18 are under consideration as they read on the elected invention and species indicated above in the instant application.

Claims 10 and 19-36 are withdrawn from consideration as being drawn to the nonelected invention and species.

2. The following is a quotation of the first paragraph of 35 U.S.C. § 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 6, 8 and 11.

It is apparent that referenced biological materials are required to practice the claimed invention. As required elements, they must be known and readily available to the public or obtainable by a repeatable method set forth in the specification. If they are not so obtainable or available, the enablement requirements of 35 USC 112, first paragraph, may be satisfied by a deposit of the pertinent cell lines / hybridomas / plasmids which produce these referenced biological materials. See 37 CFR 1.801-1.809.

In addition to the conditions under the Budapest Treaty, applicant is required to satisfy that all restrictions imposed by the depositor on the availability to the public of the deposited material will be irrevocably removed upon the granting of a patent in U.S. patent applications.

Applicant's submission that these referenced biological materials are commercially available is acknowledged. At this time, it appears that requirements for the deposit of biological materials under 35 U.S.C. § 112, first paragraph, are satisfied for the claimed biological materials.

4. Claim 2 is objected to in that the dependency of "a method of treating" on "a method of regulating" is confusing and awkward.

Applicant is invited to amend the claims accordingly.

5. Claim 1, 2, 5-9 and 11-17 are rejected under 35 U.S.C. § 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

A) Claims 1, 2, 5-9 and 11-17 are indefinite in its recitation of "regulating" because it is ambiguous as to the nature, direction (e.g. positive or negative) or degree of said "regulating".

Applicant should amend the claims to recite a clear and definite endpoint (e.g. inhibiting).

Applicant is reminded that the amendment must point to a basis in the specification so as not to add any new matter. See MPEP 714.02 and 2163.06

6. The following is a quotation of the appropriate paragraphs of 35 U.S.C. § 102 that form the basis for the rejections under this section made in this Office Action:

A person shall be entitled to a patent unless --

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

7. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office Action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(f) or (g) prior art under 35 U.S.C. 103(a).

8. Claims 1-7, 9 and 12-18 are rejected under 35 U.S.C. § 102(e) as being anticipated by Digan et al. (US 2002/0142000 A1) (see entire document, including claims, particular claim 28).

Digan et al. teach the use of anti-CD3 immunotoxins in combination with other pharmaceutical agents effective in treating various T cell mediated disorders, including acute or chronic transplant rejection, including CTLA4-Ig, anti-LFA-1 antibodies and anti-CD40 ligand antibodies (see Therapeutic Uses of Recombinant Anti-CD3 Immunotoxins on pages 12-16, including paragraph 0198 on pages 12-13). Here, Digan et al. teach various modes of administration, including separate overlapping and systemic administration. Although Digan et al. does not disclose the specific deposited materials comprising CTLA4Ig recited in claim 6, the referenced CTLA4Ig would have had the inherent properties of the CTLA4Ig produced by the deposited materials recited in claim 6.

Applicant is reminded that no more of the reference is required than that it sets forth the substance of the invention. The claimed functional limitations would be inherent properties of the referenced methods to inhibit graft rejection in transplant patients with a combination of anti-CD3 immunotoxins in combination including CTLA4-Ig, anti-LFA-1 antibodies and anti-CD40 ligand antibodies.

It is noted that the claimed methods recite "comprising" which leaves the claim open for the inclusion of unspecified ingredients even in major amounts. See MPEP 2111.03.

It does not appear that the claim language or limitations result in a manipulative difference in the method steps when compared to the prior art disclosure

9. Claims 1-9 and 12-18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Blazar et al. (WO 95/34320) (1449; Exhibit 86) in view of Larsen et al. (U.S. Patent No. 5,916,560) (1449; Exhibit 230) and Strom et al. (Therapeutic Immunology, Austen et al. (Ed.) Blackwell Science, Cambridge MA, 1996; see pages 451-456).

Blazar et al. teach methods of inhibiting antigen specific T cell responses, including inhibiting organ graft rejection, including cardiac transplant (see overlapping paragraph on pages 7-8, Tissue and Organ Transplantation on pages 23-24), with first agent which is an inhibitor of costimulatory signal together with a second agent which inhibits the generation of a delivery proliferative signal in the T cell (see entire document, including Detailed Description of the Invention and the Claims). Blazar et al. teach that the with first agent which is an inhibitor of costimulatory signal , including CTLA4 and anti-LFA-1 antibody as the second agent which inhibits the generation of a delivery proliferative signal in the T cell (See Summary of the Invention on pages 2-4; Detailed Description of the Invention, including pages 6-8, including Bone Marrow Transplantation - Inhibition of GVHD on pages 22-23; Tissue and Organ Transplantation on pages 23-24; and Claims ). In addition, Blazar et al. teach treating a variety of subjects (page 19, lines 30-32) in a variety of known modes of administration in effects amounts to achieved the desired result (see Compositions on pages 21 and Uses of the Invention on pages 21-24).

Blazar et al. differs from the claimed invention by not disclosing the combination of a third inhibitor of CD40 ligand interactions in methods of inhibiting transplant rejection. It is noted that Blazar et al. Does teach targeting gp39 (page 8, line 6), which is the CD40 ligand.

Larsen et al. teach methods of inhibiting immune responses by blocking CD40L/CD40 and CTLA4/CD28/B7 pathways ,including inhibiting transplant rejection and cardiac allografts (column 6, paragraphs 4, 7 ), including the combination of CTLA4 and anti-CD40 ligand antibody (e.g. MR1) (see Detailed Description of the Invention (e.g. see columns 5-10 and Examples on columns 10-18) (see entire document). Larsen et al. teach the advantages of inhibiting or blocking both CTLA4/B7 and CD40L/CD40 pathways in promoting prolonged immunosuppression (see column 10, paragraph 3 and Discussion on columns 18-19). Larsen et al. teach treating in a variety of subjects (column 8, paragraph 6) in a variety of known modes of administration depending on the location of the tissue or disease being treated as well as the severity and course of the medical disorder in the judgment of the treating physician (see columns 9-10).

Although and Blazar et al. and Larsen et al. do not disclose the specific deposited materials comprising CTLA4Ig recited in claim 6, the referenced CTLA4Ig would have had the intrinsic properties of the CTLA4Ig produced by the deposited materials recited in claim 6.

In addition to the teachings of Blazar et al. and Larsen et al., it was known at the time the invention was made that the use of immunosuppressive therapy relies upon a number of basic principles as set forth in Strom et al. These principles include that different agents are used, each of which is directed at a different molecular target and aimed at interrupting several discrete stages in the immune activation pathway (e.g. see page 451 and Figure 36.1). Also, additive-synergistic effects are achieved through the application of each agent at a relatively low dose, thereby limiting the toxicity of each individual agents while increasing the total immunosuppressive effect (see page 451, column 1, paragraph 2).

Therefore, it would have obvious to a person of ordinary skill in the art at the time the invention was made to apply the teachings of Larsen et al. to those of Blazar et al. to obtain a combining CTLA4Ig and anti-CD40 ligand antibodies, given their increased immunosuppressive properties, to the Blazar's second agent anti-LFA-1 antibodies which inhibits the generation of a delivery proliferative signal in the T cell to increase the efficacy of immunosuppression in therapeutic regimens to promote the long term survival of transplants, including cardiac allografts at the time the invention was made. According to Blazar et al., Larsen et al. and Strom et al., a person of ordinary skill in the art would have been motivated to combine immunosuppressives to produce an increased immunosuppressive regimen in promoting graft survival at the time the invention was made. In addition to the evidence and expectation of success in combining immunosuppressive agents, including those claimed, the use of combination therapy with biologicals would have had the expected advantage of reducing the toxicity of immunosuppressive regimens associated with transplantation at the time the invention was made, as taught by Strom et al.

A person of ordinary skill in the art would have recognized that the combination of three immunosuppressive agents such as CTLA4Ig, anti-CD40 ligand antibodies and anti-LFA-1 antibodies discussed by the references above would have had advantages of increased immunosuppression and decreased toxicity in achieving antigen-specific nonresponsiveness in promoting long terms survival of transplanted tissues and organs at the time the invention was made. Given the referenced and art known modes of administration at the time the invention was made, the ordinary artisan would have administered the agents locally or systemically as well as sequentially or concurrently given the nature of the grafted tissue or organ and the needs of the patient. Therefore, a person of ordinary skill in the art would have a reasonable expectation of success at the time the invention was made. From the teachings of the references, it was apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole was prima facie obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.

10. Claims 6, 8, 11 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Blazar et al. (WO 95/34320)(1449; Exhibit 86) in view of Larsen et al. (U.S. Patent No. 5,916,560) (1449; Exhibit 230)and Strom et al. (Therapeutic Immunology, Austen et al. (Ed.) Blackwell Science, Cambridge MA, 1996; see pages 451-456) as applied to claims 1-9 and 12-18 above and further in view of the known availability of the deposited material producing the known immunosuppressives selected from the group consisting of CTLA4, anti-CD40L antibodies and anti-LFA-1 antibodies, as acknowledged on pages 15-16 of the instant specification and cited in published references).

Blazar et al. in view of Larsen et al. and Strom et al. differ from the claimed methods by not disclosing all of known sources of the immunosuppressive CTLA4, anti-CD40L antibodies and anti-LFA-1 antibodies.

Pages 15-16 of the instant specification, including citations to published references acknowledge the availability of known sources of the immunosuppressive CTLA4, anti-CD40L antibodies and anti-LFA-1 antibodies at the time the invention was made.

Given the immunosuppressive properties of these known sources of immunosuppressive CTLA4, anti-CD40L antibodies and anti-LFA-1 antibodies, one of ordinary skill in the art would have been motivated to modify or substitute these known immunosuppressive agents into the methods of inhibiting T cell mediated immune responses, including inhibiting transplant rejection as taught by Blazar et al. and Larsen et al. with an expectation of success. In addition to the evidence and expectation of success in combining immunosuppressive agents, including those claimed, the use of combination therapy with biologicals would have had the expected advantage of reducing the toxicity of immunosuppressive regimens associated with transplantation at the time the invention was made, as taught by Strom et al. A person of ordinary skill in the art would have recognized that the combination of three immunosuppressive agents such as CTLA4Ig, anti-CD40 ligand antibodies and anti-LFA-1 antibodies discussed by the references above, including the art known agents, acknowledged by the specification as filed, would have had advantages of increased immunosuppression and decreased toxicity in achieving antigen-specific nonresponsiveness in promoting long terms survival of transplanted tissues and organs at the time the invention was made.

Given the referenced and art known modes of administration at the time the invention was made, the ordinary artisan would have administered the agents locally or systemically as well as sequentially or concurrently given the nature of the grafted tissue or organ and the needs of the patient. Therefore, a person of ordinary skill in the art would have a reasonable expectation of success at the time the invention was made. From the teachings of the references, it was apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole was prima facie obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.

11. Claims 1-9 and 11-18 are rejected under 35 U.S.C. § 103(a) as being unpatentable over Digan et al. (US 2002/0142000 A1) (see entire document, including claims, particular claim 28) in view of Strom et al. (Therapeutic Immunology, Austen et al. (Ed.) Blackwell Science, Cambridge MA, 1996; see pages 451-456) and of the known availability of the deposited material producing the known immunosuppressives selected from the group consisting of CTLA4, anti-CD40L antibodies and anti-LFA-1 antibodies, as acknowledged on pages 15-16 of the instant specification and cited in published references).

Digan et al. teach the use of anti-CD3 immunotoxins in combination with other pharmaceutical agents effective in treating various T cell mediated disorders, including acute or chronic transplant rejection, including CTLA4-Ig, anti-LFA-1 antibodies and anti-CD40 ligand antibodies (see entire document, including Therapeutic Uses of Recombinant Anti-CD3 Immunotoxins on pages 12-16, including paragraph 0198 on pages 12-13). Here, Digan et al. teach various modes of administration, including separate overlapping and systemic administration. Although Digan et al. does not disclose the specific deposited materials comprising CTLA4Ig recited in claim 6, the referenced CTLA4Ig would have had the inherent properties of the CTLA4Ig produced by the deposited materials recited in claim 6.

Digan et al. differs from the claimed methods by not disclosing all of known sources of the immunosuppressive CTLA4, anti-CD40L antibodies and anti-LFA-1 antibodies.

In addition to the teachigs of Digan et al., it was known at the time the invention was made that the use of immunosuppressive therapy relies upon a number of basic principles as set forth in Strom et al. These principles include that different agents are used, each of which is directed at a different molecular target and aimed at interrupting several discrete stages in the immune activation pathway (e.g. see page 451 and Figure 36.1). Also, additive-synergistic effects are achieved through the application of each agent at a relatively low dose, thereby limiting the toxicity of each individual agents while increasing the total immunosuppressive effect (see page 451, column 1, paragraph 2).

Pages 15-16 of the instant specification, including citations to published references acknowledge the availability of known sources of the immunosuppressive CTLA4, anti-CD40L antibodies and anti-LFA-1 antibodies at the time the invention was made.

Given the immunosuppressive properties of these known sources of immunosuppressive CTLA4, anti-CD40L antibodies and anti-LFA-1 antibodies, one of ordinary skill in the art would have been motivated to modify or substitute these known immunosuppressive agents into the methods of inhibiting T cell mediated immune responses, including inhibiting transplant rejection as taught by Blazar et al. and Larsen et al. with an expectation of success.

Given the immunosuppressive properties of these known sources of immunosuppressive CTLA4, anti-CD40L antibodies and anti-LFA-1 antibodies, one of ordinary skill in the art would have been motivated to modify or substitute these known immunosuppressive agents into the methods of inhibiting T cell mediated immune responses, including inhibiting transplant rejection as taught by Digan et al. with an expectation of success. In addition to the evidence and expectation of success in combining immunosuppressive agents, including those claimed, the use of combination therapy with biologicals would have had the expected advantage of reducing the toxicity of immunosuppressive regimens associated with transplantation at the time the invention was made, as taught by Strom et al. A person of ordinary skill in the art would have recognized that the combination of three immunosuppressive agents such as CTLA4Ig, anti-CD40 ligand antibodies and anti-LFA-1 antibodies discussed by the references above, including the art known agents, acknowledged by the specification as filed, would have had advantages of increased immunosuppression and decreased toxicity in achieving antigen-specific nonresponsiveness in promoting long terms survival of transplanted tissues and organs at the time the invention was made. Given the referenced and art known modes of administration at the time the invention was made, the ordinary artisan would have administered the agents locally or systemically as well as sequentially or concurrently given the nature of the grafted tissue or organ and the needs of the patient. Therefore, a person of ordinary skill in the art would have a reasonable expectation of success at the time the invention was made. From the teachings of the references, it was apparent that one of ordinary skill in the art would have had a reasonable expectation of success in producing the claimed invention. Therefore, the invention as a whole was prima facie obvious to one of ordinary skill in the art at the time the invention was made, as evidenced by the references, especially in the absence of evidence to the contrary.

12. No claim allowed.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Phillip Gambel whose telephone number is (703) 308-3997. The examiner can normally be reached Monday through Thursday from 7:30 am to 6:00 pm. A message may be left on the examiner's voice mail service. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Chan can be reached on (703) 308-3973. Any inquiry of a general nature or relating to the status of this application should be directed to the Technology Center 1600 receptionist whose telephone number is (703) 308-0196.

Serial No. 09/877987
Art Unit 1644

Papers related to this application may be submitted to Technology Center 1600 by facsimile transmission. Papers should be faxed to Technology Center 1600 via the PTO Fax Center located in Crystal Mall 1. The faxing of such papers must conform with the notice published in the Official Gazette, 1096 OG 30 (November 15, 1989). The CM1 Fax Center telephone number is (703) 872-9306.

Phillip Gambel, PhD.
Primary Examiner
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November 17, 2003